Appendix E

Evaluation of Disposal of Moab Tailings in Salt Caverns Within the Paradox Formation

E1.0 Introduction

In late 2003, the U.S. Department of Energy (DOE) considered an option to dispose of the Moab mill tailings in solution-mined salt caverns either at the DOE-owned Moab site or off-site at two potential locations. From the initial analysis, disposal of uranium mill tailings in solution mined salt caverns appeared to have potential advantages in terms of long-term risk reduction over the more conventional methods of capping tailings or disposal at off-site locations. Consequently, DOE took a closer look at this option. Potential advantages of salt cavern disposal might include greater long-term isolation, reduced long-term commitment of surface acreage, and dual usage of injection wells for contaminated ground water disposal. Further analysis shows that this option's advantages do not outweigh the disadvantages. Technical uncertainty, cost, schedule, and the demand on river water are among disadvantages for this option as compared to the other alternatives in this EIS.

Conceptually, solution-mining techniques would be used to create disposal caverns in the salt beds of the Paradox Formation beneath the Moab site or at other potential locations, such as the commercial potash mine site approximately 6 air miles downstream from Moab or in the area of Sevenmile Canyon; both areas are controlled by private entities. The use of off-site locations would entail DOE acquiring the necessary lands, leases, mineral rights, and associated permits for Federal ownership in perpetuity.

This option would involve withdrawal of significant quantities of Colorado River water, on the order of 1,700 gallons per minute (gpm) for 20 years (880 million gallons per year, or 73 million gallons per month). The water would be used as part of the solution mining process and would become saturated with salt, generating brine that would require disposal by deep well injection or solar evaporation or perhaps could be used in the future by commercial potash mining operations.

Other disadvantages of this option include:

- The potential need to purchase water rights and pay water depletion fees associated with compensation of existing water right holders because of impairment;
- Uncertainties of implementing a complex, first-of-a-kind disposal technique for radioactive waste;
- The long projected completion time of surface remediation under this alternative that could be 3 or 4 times as long as all other alternatives (up to a few decades to go operational with a 20-year operations time frame, culminating in a project life cycle range of multiple decades);
- Life-cycle cost range for this salt cavern alternative ranges from $892 million to $1.3 billion;
- The potential for substantial schedule and cost growth over the estimates generated in this evaluation based on the existing technical, geological, hydrological, seismological, legal, economic, and operational uncertainties;
- DOE would need to invest several years and millions of dollars to study this option to resolve uncertainties with no guarantee of success;
- Lease or purchase fees for extractive resource rights, land, and infrastructure;

- Uncertainty in obtaining multiple leases from the State of Utah and drilling multiple wells to determine the presence of oil, gas, potash, and mineral resources;
- Processing of brine and acquisition of specialty materials necessary to work in a highly corrosive environment.

Section E2.0 of this appendix further defines the conceptual approach to this option and identifies uncertainties relevant to the ability to execute this option. Section E3.0 provides a preliminary estimate of the potential cost of this option and compares that cost to the other alternatives evaluated in this EIS. Section E4.0 describes advantages and disadvantages of salt cavern disposal. Section E5.0 evaluates this option in the context of its viability and resonableness or lack thereof under NEPA.

E2.0 Conceptual Approach

Three potentially geologically suitable sites in the Moab area where the Paradox Formation is several thousand feet thick were examined. The sites include the following options: (1) the on-site option using the DOE-owned Moab millsite, (2) the off-site option near the potash mine site that is privately owned by Intrepid Mining, LLC (Intrepid) and located approximately 6 air miles southwest of the Moab millsite, and (3) the off-site option of using the Sevenmile Canyon site that is also privately owned by Intrepid and located approximately 7 air miles northwest of the Moab millsite. The two off-site locations considered might not be available to DOE. Consultation with the Army Corp of Engineers would be needed to estimate the magnitude of the site acquisition process A location and land ownership map, geologic cross sections, and brief descriptions of each of the three potential disposal sites are presented in Attachment 1, Figures 1 through 7.

The Paradox Formation consists of a sequence of salt beds several thousand feet thick in the Moab area (see geologic cross sections in Attachment 1, Figure 3). Caverns within the salt formation would be created by solution-mining techniques similar to those used extensively in the United States to store liquid and gas products. Solution mining would consist of injecting fresh water into the Paradox Formation to dissolve the salt until each of the multiple caverns is developed to the required size (about 200 feet in diameter by 2,000 feet in height). The mining solutions would become saturated with dissolved salts (brine) and would be pumped to the surface for disposal (880 million gallons per year, or 73 million gallons per month) by any one or a combination of methods, including (1) deep underground injection into the underlying Leadville Limestone; (2) multiple solar evaporation ponds up to 500 acres in size; and (3) consumption by the Intrepid potash mining operation. Tailings would be slurried several thousand feet below ground surface into the caverns for disposal and geologic isolation. Issues examined in the evaluation of this conceptual approach include constructing the caverns, disposal of the brine solution, slurrying the tailings into the salt caverns for disposal; relationship to oil, gas, and potash resources; property ownership; and permitting. The existing underground workings at the potash mine (large rooms with pillars) are not available for tailings disposal because of ongoing solution-mining operations in the old workings to prolong mine life.

E2.1 Cavern Construction

Both solution mining and conventional mining techniques have been used to create disposal caverns in nonradioactive environments. Conventional underground mining to develop disposal caverns was not considered further because those costs would be substantially higher than solution-mining methods.

Solution mining is a proven technology that has been used by DOE as part of the Strategic Petroleum Reserve (SPR) to create caverns for the storage of 700 million barrels of petroleum. Solution mining to create salt caverns is also used extensively in the United States by private industry to store liquid and gas products. Ferrell Gas Company developed a relatively small (about 267,000 cubic feet; considerably smaller cavern than those required for tailings disposal) salt cavern for natural gas storage in the Paradox Formation approximately 1.5 miles southeast of the Moab site in the 1960s.

The conceptual approach for disposal of approximately 8.9 million cubic yards of Moab tailings (equivalent to 11.9 million tons, assuming 101 pounds per cubic foot of moist tailings) presumes 6 caverns are created during a 20year period. Assuming the waste volume will bulk by 20 percent, an estimated 10.5 million cubic yards of salt would be mined to create the caverns. The caverns would need to be filled with brine or gas (a volume equivalent of 10.5 million cubic yards) to keep them open until the tailings are deposited. Caverns would be mined sequentially with each cavern being developed in 3 years then filled with mill tailings during the following 3 years. The total life of the project would depend on the permitting, initial cavern startup, and the time to fill the last cavern with the last of the mill tailings. This schedule from obtaining approvals and regulatory permits to the end of tailings disposal could be up to multiple decades with the associated technical, legal, economic, and regulatory uncertainties.

Each cavern would be approximately 200 feet in diameter and 2,000 feet in height, similar to the dimensions of the caverns used at the SPR. The top of the caverns would be encased at least 500 feet beneath the top of the salt formation and at least 2,000 feet beneath ground surface. The conceptual cavern locations would be (1) on-site, underneath the DOE Moab millsite or (2) on privately owned land (Sevenmile Canyon site or Intrepid potash mine area), where adequate thickness of the Paradox Formation is assumed to exist at reasonable depths beneath the ground surface. An illustration of the caverns for this conceptual approach is shown in the geologic cross sections provided in Attachment 1, Figures 3, 5 and 7, for each of the three potential disposal sites. Characterization of the geological, hydrological, seismological, biological, and climate change conditions would be required.

E2.2 Brine Disposal

According to the solution-mining engineers with whom DOE consulted, brine disposal is considered one of the most significant technical challenges to this concept. The estimated rate of brine production from solution mining the caverns would be approximately 1,700 gpm for a 20-year production period. This amounts to an estimated total water consumption of 15 billon gallons over the life of the project. Deep-sea disposal of the brine was the option selected for expansion of the SPR program, but that disposal option is not available for this project. Because salt is generally in oversupply, it is not easily marketable without significant disruption of markets for existing commercial producers. Other sites in the United States use underground injection wells as the option for brine disposal. The U.S. Bureau of Reclamation (USBR) is currently using deep well injection for disposal of brine at its Paradox Valley, Colorado, site adjacent to the Dolores River. USBR operating costs are high; injection pressures are also high and lead to some technical and operational difficulties. The design life of the wells is 100 years, the injection depth is 16,000 feet below ground surface and cost is $2 million per year to inject 230 gpm through one well screened at 16,000 feet below ground surface.

Because of the limited options for brine disposal, deep well injection into a permeable geologic formation is the primary method of choice to dispose of the brine solutions for this conceptual approach. The option of brine disposal solely by injection into the Leadville Limestone offers the possibility of minimizing overall costs, but this option has a higher technical uncertainty associated with (1) locating the desirable aquifer characteristics (no hydraulic connection to ground water or surface water and high porosity); (2) inherent possibilities of generating micro-seismicity; (3) potentially high surface wellhead pressures; (4) corrosivity to wells and equipment; (5) a relatively large subsurface footprint (see Attachment 1, Figures 3, 5, and 7); and (6) potential impacts to oil, gas, or potash resources that may be present in the injection horizon (Leadville Formation).

Other brine disposal methods available include (1) evaporation of the brine solution at multiple ponds constructed (up to 500 acres in size) at on-site or off-site locations; (2) transport and surface storage of the salt at the Intrepid potash site for future mining operations, and (3) consumption of the brine solution by ongoing Intrepid mining operations. Intrepid's potash site includes a salt storage area that once stored 4 to 5 million tons of salt. The company is consuming the remaining stockpiled salt at a rate of 650 gpm of brine that will be depleted in 2 to 3 years. The salt storage facility is nearly empty but could be reused for long-term storage of salt from the evaporation ponds. The opportunity exists for Intrepid to consume approximately the equivalent amount of brine (650 gpm) developed during solution mining of the disposal caverns. This consumption rate is optimally only one-third the total rate that would be required and may not be constant during the year; therefore, the alternate disposal options of deep aquifer injection and pond storage together would be necessary to potentially allow management of the brines developed during cavern growth.

Brine disposal cost based on evaporation and storage is higher than for deep aquifer disposal or for consumption by the ongoing potash mining operations. The cost for disposal via consumption by the ongoing Intrepid mining operation appears attractive but may be unreliable if Intrepid should curtail potash production or transfer ownership to an uncooperative owner. In addition, developing appropriate and durable contractual commitments with Intrepid for storage and/or consumption of salt and/or brine may be problematic because this model is untried and unproven.

The availability of three brine disposal options —(1) deep injection, (2) evaporation and storage, and (3) consumptive use, each with the potential to accept a third or more of the brine stream — provides flexibility to optimize the approach both during design and operations. Likely, DOE would have to implement all three options. Costs for brine disposal are, therefore, based on a combination of the three disposal options. For example, sole reliance on deep well injection and reduced ability of subsurface formations to accept the requisite flow rates could substantially increase the operational life of the project and increase the cost of brine disposal. The uncertainties could only be evaluated through extensive field studies.

E2.3 Tailings Slurry

The slurry system would involve screens, ball mill, thickener, and a pumping station and is assumed to require essentially the same site infrastructure for both on-site and off-site salt-cavern tailings disposal. Slurry transport is detailed in the EIS as a transportation mode for the conventional off-site disposal alternatives. The tailings would be conveyed through a slurry pipeline to the off-site locations, only nominal pipeline lengths would be required for on-site disposal. The pipeline to the Intrepid site or Sevenmile Canyon site is assumed to be above ground along the railroad bed. A pipeline would have to be constructed at least 8 miles to transport contaminated slurry to the off-site locations. If this pipeline route is not acceptable to the railroad and/or State of Utah, the other option is to bury the pipeline in State Highway 279 or Highway 191 right-of-way at a higher capital cost of installation and decommissioning. A leak-detection system would have to be installed to isolate the system if a leak or line break occurs. For the on-site salt cavern option, the same tailings preparation system is required, but only a short pipeline would be required on-site to convey tailings to the injection points.

For the purpose of estimating cost, the oversized material is assumed to be trucked and disposed of at a licensed disposal cell. Cost estimate for this scope is the same as that identified in the EIS for the off-site alternatives using the slurry pipeline method of transportation.

E2.4 Tailings Disposal

This concept proposes that the Moab site tailings would be slurry injected into the caverns. The multiple cavern volumes (approximately 8.9 million cubic yards is based on the known quantities of tailings plus a 20 percent bulk addition to make the slurry) assume the mill tailings will settle in the cavern and separate out from the water used to slurry the tailings. If tailings do not settle out and separate from the water, a larger cavern volume will be required to accommodate the tailings and slurry water. Studies would have to be completed to characterize the ability of slurry water to separate from the tailings. Brine displaced during injection of the mill tailings slurry into the caverns would be radioactively contaminated with fine uranium mill tailings. This overflow could be recycled back to the slurry plant by constructing an additional return 8-mile pipeline or could be permanently disposed of in a dedicated well permitted for deep injection of the radioactive contaminated brine. The return pipeline would be co-located with the pipeline discussed in Section E2.3. Because the brine-disposal injection well would be underutilized once cavern mining is completed, the well could be used to dispose of radioactively contaminated ground water from the Moab site. For both the on-site and off-site options, it is assumed that radioactively contaminated ground water would be mixed with slurry material during tailings placement and then later disposed of by deep well injection for the remainder of the 75 to 80 years of pumping the contaminant plume in the alluvial aquifer.

E2.5 Oil, Gas, Potash, and other Mineral Resources

Oil, gas, potash, and other minerals are known to exist in the vicinity of the two off-site locations. Studies and well drilling would have to be completed to characterize and verify mineral occurrences. Whether or not these mineral resources exist in the vicinity area, State of Utah well drilling permits and mineral lease tracts would be required. Potash ore has been produced by underground and solution mining since 1964 at the Intrepid site from a large block of land under active potash leases. Unlike the other site options, small amounts of oil and gas have been produced from the Long Canyon and Cane Creek fields near the Intrepid site. Production at these fields has been from the Cane Creek zone near the base of the Paradox Formation. This zone is approximately 1,000 feet below the bottom of solution-mined caverns in the Paradox Formation that are proposed for the Intrepid site. The Cane Creek zone is also present in the subsurface at the Sevenmile Canyon site and is in a similar position in relation to solution-mined caverns proposed at that site.

Issuance of oil and gas leases in areas that have active potash leases has been a concern in the Intrepid area where commercial mining is ongoing. To avoid conflict, the State of Utah Division of Oil, Gas, and Mining, has allowed oil and gas leases in potash-leased areas to occur with precautionary stipulations if they otherwise meet Utah's applicable requirements. Specific oil and gas well locations are considered on a case-by-case basis to determine horizontal and vertical buffer zones and appropriate fluid injection pressures that would prevent fluid communication and seismic effects to the solution-mining operation. Similar regulations and stipulations would need to be formulated to allow exploration for oil and gas at the sites where solution-mined caverns and deep injection into Leadville Limestone are proposed. Establishment of horizontal and vertical buffer zones and appropriate restrictions for oil and gas leases that may be required could alter the locations and costs of the solution-mined caverns as currently conceptualized. A large cost contingency would have to be estimated to cover this uncertainty.

In the Moab Valley, several caverns in the Paradox Formation have been created by salt dissolution for storage of natural gas. These operations are at least 1.5 miles southeast of the solution-mined caverns proposed for the Moab millsite and are assumed to be located a sufficient distance from the millsite so that storage of natural gas would not be affected. However, geologic, hydrological, biological, and seismic studies would have to be completed to support this assumption.

E2.6 Property Ownership

Approximately 1,700 gpm of fresh water (880 million gallons per year, or 73 million gallons per month) would be required for a 20-year period to perform solution-mining activities. In addition, state and privately owned lands exist in the immediate vicinity of the proposed operations. Obstacles associated with this approach include:

- Transfer existing 1,360 gpm of surface water rights (currently owned by DOE for the millsite, with a current consumption of 50 gpm annually) to a different intended use;
- Acquire the existing additional 340 gpm of water rights (solution mining would require 25 instead of 20 years if additional water rights were unavailable);
- Demonstrate maintenance of sufficient stream flow in the Colorado River to comply with Threatened and Endangered Species Act requirements; and
- Purchase private property (from Intrepid and potentially other private parties) to develop required infrastructure.

E2.7 Permitting

This conceptual approach would require State of Utah Class IV underground injection permits for the tailings, contaminated ground water, and disposal of brine solutions. Rights-of-way and various Federal and State permits would be required for access to and use of the potential disposal sites. A legal agreement would be required with the railroad and/or State of Utah to permit DOE placement of the aboveground slurry line on its property or right-of-way and with Intrepid for the off-site disposal options.

Potential additional environmental permits that would be required include, but may not be limited to,

- Air emission permit (NSR, NESHAPS);
- State wastewater disposal permit (evaporative lagoons);
- State solid waste permit (salt disposal);
- State mining permit;
- Federal storm water permit; and
- Pollution prevention permit.

Concurrence and/or approval from the U.S. Nuclear Regulatory Commission (NRC) would be required for disposal of the Moab tailings in the salt caverns and for the underground injection of contaminated brine and ground water. NRC concurrence and/or approval would also be required for disposal of the 35,000 cubic yards of contaminated solid debris that would not be disposed of in the salt cavern.

E3.0 Cost Estimates

This section provides a preliminary estimate of cost for the salt cavern disposal option and compares that cost to the other alternatives analyzed in this EIS. Several assumptions and tasks are not included in the preliminary cost estimate. Items omitted from the preliminary cost estimate because of the difficulty in estimating costs, but accounted for in contingency include, but may not be limited to:

- Site characterization requirements to demonstrate feasibility of this option;
- Lease or purchase fees for extractive resource rights, land, and infrastructure;
- Access fees;
- Processing of brine and acquisition of specialty materials necessary to work in a highly corrosive environment;
- Purchase of water rights and fees associated with compensation of existing water right holders related to impairment;
- Identification of suitable geologic and hydrologic locations for activities;
- Special design requirements;
- Permitting requirements;
- Cavern construction;

- Brine disposal; and
- Cost impacts related to adjacent extractive industry leases.

The cost estimates included are based on the same basic assumptions used in the EIS for the analyzed alternatives. The basic cost components include

- Infrastructure;
- Excavation of tailings;
- Slurry system;
- Solution mining;
- Disposal of brine; and
- Project management/oversight.

The range of costs is presented in Table E−1. Table E–2 provides the major components of the salt cavern scenario. The life-cycle cost range for the salt cavern alternative is $892 million to $1.3 billion. The low end reflects the simplest method of injecting the tailings into salt caverns below the Moab millsite and injecting the uncontaminated brine and radioactive contaminated brine into the Leadville Limestone below the salt caverns. The higher cost reflects conveying the tailings by slurry pipeline approximately 8 miles to an off-site location and a worse-case scenario of building multiple evaporation ponds (500 acres) to dispose of the salt brine on site or off site. Both on-site and off-site tailings disposal options require approximately 75 to 80 years of active ground water restoration. It is assumed that contaminated ground water will be mixed with slurry during tailings placement and then later injected into the deep disposal wells for the necessary 75 to 80 years of pumping the contaminant plume in the alluvial aquifer.

Table E−1. Preliminary Estimated Costs for Disposal of the Moab Tailings in Salt Caverns and Comparison to On-Site and Off-Site Alternatives in the EIS

	On-Site Cap-In-Place	IUC White Mesa Mill		Crescent Junction		Klondike Flats		Salt Cavern	
		Truck	Slurry	Truck	Slurry	Truck	Slurry	On-Site	Off-Site
Construction Costs									
	$151M	$382M	$423M	$304M	$366M	$300M	$359M	$445M[a]	$683M[a]
Long-Term Costs (Long-Term Surveillance and Maintenance, Ground Water Construction and Operations)									
	$75M[b]	$70M[b]	$70M[b]	$70M[b]	$70M[b]	$70M[b]	$70M[b]	$60M[b,c]	$60M[b,c]
Subtotal	**$226M**	**$452M**	**$493M**	**$374M**	**$436M**	**$370M**	**$429M**	**$505M**	**$743M**
Contingency	10%	10%	10%	10%	10%	10%	10%	[d]	[d]
Subtotal	**$22.6M**	**$45.2M**	**$49.3M**	**$37.4M**	**$43.6M**	**$37.0M**	**$42.9M**	**$387M**	**$578M**
Total	**$249M**	**$497M**	**$542M**	**$411M**	**$480M**	**$407M**	**$472M**	**$892M**	**$1,321M**

[a] Represents all pre-contingency costs minus surveillance and maintenance costs from Table E–2, below.
[b] Cap-in-place ground water remediation costs are slightly greater than off-site alternatives due to an estimated 5 additional years of ground water restoration efforts. Ground water remediation costs for the salt cavern disposal scenario are less than the other alternatives due to dual usage of injection wells for brine and contaminated ground water disposal.
[c] Represents surveillance and maintenance costs from Table E–2, below
[d] Salt cavern approach cost contingencies developed as per Table E–2, below.

Table E−2. Major Cost Components for Disposal of the Moab Tailings in Salt Caverns

Major Cost Components	Costs ($ Millions) On-site	Costs ($ Millions) Off-site	Comments
Site characterization	$4	$15	Test cavern and brine disposal wells
Environmental H&S/NEPA	$16	$35	UIC Permit
Remedial action design	$3	$5	
Site acquisition	$1	$4	For brine/tailings disposal areas
Remedial action field management	$70	$81	Double shift for 20 years
Site preparation	$6	$20	Temp facilities, electricity
Tailings handling	$73	$170	Slurry Prep, Disposal
Cover material	N/A	N/A	
Erosion protection	N/A	N/A	
Site restoration	$12	$30	Reclaim millsite, Moab Wash, wells
All other construction costs	$237	$300	Well stimulation, salt transport
Surveillance and maintenance	$60	$60	Includes long-term ground water costs
Subtotal	**$482**	**$720**	
Contingency (80%)	$385	$576	
Vicinity property design	$1	$1	
Vicinity property construction	$10	$10	
TAC project management	$12	$12	For 6-year period - pre-remediation
Subtotal	$**23**	$**23**	
Contingency (10%)	$2	$2	
Grand Total	$**892**	$**1,321**	

Note: Vicinity property (VP) design, VP construction, and project management have lower uncertainty and, therefore, lower contingency values (10 percent). Eighty percent contingency for other costs based on guidance in DOE Order 413.3. Costs for this approach are pre-conceptual and represent rough order of magnitude.

Preliminary cost estimates for tailings disposal in salt caverns mined beneath the Moab millsite and for off-site disposal in salt caverns mined beneath the Intrepid site or beneath the Sevenmile Canyon site are significantly higher than for the alternatives presented in the EIS because of high capital costs, high operations and maintenance requirements, and high risk contingency. Risk management principles are applied in this case as a major input cost factor for predicting the probability of successfully defining and implementing the disposal concept of slurrying the Moab uranium tailings into salt caverns. Life-cycle costs of remediating and disposing of remaining waste, both uncontaminated and contaminated, in the ponds and with the slurry pipeline will increase the cost of the off-site options. The application of risk management increases the estimated costs and schedule significantly to the $892 million to $1.3 billion range.

E4.0 Advantages and Disadvantages of Salt Cavern Disposal

Relative advantages and disadvantages of tailings disposal in solution-mined salt caverns as compared to the on-site and off-site alternatives presented in the EIS are summarized below.

Advantages of salt cavern disposal include the following points:

- Provides the potential for longer term isolation and more protection than other alternatives;

- Offers the least long-term environmental impact because no surface footprint would remain at the conclusion of the disposal period;
- Provides disposal option for contaminated ground water for 50 of the 75 to 80 years of required ground water remediation.

Disadvantages of salt cavern disposal include the following points:

- Withdrawal of large quantities of Colorado River water that could impact the river and protected aquatic species;
- Technical uncertainties associated with both the uncontaminated brine and radioactively contaminated brine disposal are greater;
- Remediation time frame to complete the tailings disposal phase of the project is greater;
- Potential contractual uncertainty for use of privately owned sites and operations;
- Substantial technical, legal, operational, and life-cycle cleanup cost uncertainties.

E5.0 Conclusions

Disposal of uranium mill tailings in underground salt formations has never been attempted in the United States or elsewhere.

Because of the unproven concept, a large contingency factor must be applied to the total estimated cost. This contingency may not sufficiently account for the uncertainties and unknowns. Resolving these uncertainties sufficiently so that the decision-makers could be sure that this concept can be validated as technically feasible and implementable would require a considerable investment in time and money for additional studies, including injection well testing, subsurface characterization, salt cavern performance assessment, and permitting, all of which are required for a proof of concept. Such studies could require millions of dollars and years to complete, with no guarantee that the investment would demonstrate that this alternative is viable.

DOE has considered the salt cavern disposal option in view of guidance on evaluating alternatives in the Council on Environmental Quality's NEPA regulations (40 CFR 1500–1508). Given the technical, legal, and economic uncertainties associated with this approach, the time and cost needed to resolve the uncertainties and the potential disadvantages, DOE has concluded that this option is not "practical or feasible" and, therefore, is not a reasonable alternative that should be analyzed in detail in this EIS.